INDIAN HEART JOURNAL 68 (2016) S156–S157

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/ihj

Images in Cardiology

Doughnut appearance of left ventricle in isolated left ventricular endomyocardial fibrosis

Mahim Saran [a,*], *Sivasankaran Sivasubramonian* [b]

[a] *2nd Year DM Cardiology Resident at Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram 695011, Kerala, India*

[b] *Professor, Department of Cardiology, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram 695011, Kerala, India*

ARTICLE INFO

Article history:
Received 10 November 2015
Accepted 22 December 2015
Available online 11 January 2016

Keywords:
Endomyocardial fibrosis
Doughnut
LV angiogram

ABSTRACT

A 55-year-old female presented with worsening dyspnea secondary to left ventricular endomyocardial fibrosis (EMF). Obliteration of left ventricular apex and hypertrophied papillary muscle gave the classical appearance of a ''doughnut'' on left ventricular angiography.

We present here a novel doughnut appearance of left ventricle on angiogram.

1. Background

Endomyocardial fibrosis is characterized by replacement of normal endocardial cells by fibrous tissue with or without extension into the myocardium. It mainly involves the apex and subvalvular regions of one or both ventricles. Biventricular involvement remains the most common, with isolated left ventricular involvement being relatively less common than right.

We report a case of a 55-year-old female with isolated LV EMF, where obliterated LV apex and hypertrophied papillary muscle gave the appearance of a doughnut on LV angiography.

2. Case report

A 55-year-old female, known diabetic and hypertensive with no family history of cardiovascular disease presented with complaints of dyspnea on exertion NYHA class II since 7 years with recent worsening of dyspnea. Systemic examination was unremarkable.

Her ECG showed intraventricular conduction delay with left bundle branch block morphology. Echocardiography demonstrated a grossly dilated left atrium with mild dilated left ventricle, obliteration, and calcification of the apex of the left ventricle and restrictive inflow pattern across mitral valve. The diagnosis of left ventricular endomyocardial fibrosis was

* *Corresponding author.*
E-mail address: mahimsaran2011@gmail.com (M. Saran).

http://dx.doi.org/10.1016/j.ihj.2015.12.017

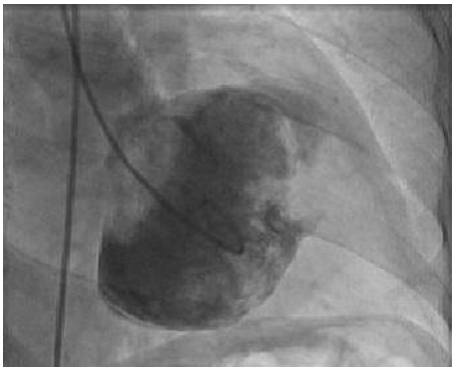

Fig. 1 – Cardiac catheterization showing obliteration of LV apex with horizontal dilatation of LV base.

made based on 1 major (Obliteration of apex of left ventricle) and 2 minor criteria (Dilated left atrium and restrictive flow pattern across mitral valve).[1]

Cardiac catheterization showed features of restrictive filling and obliteration of LV apex with horizontal dilatation of LV base (Fig. 1). Left ventricular angiography showed circular LV cavity due to obliterated apex with the central filling defect created by the hypertrophied papillary muscle, thus giving a classical ''Doughnut'' appearance during the diastolic phase of the cardiac cycle (Fig. 2).

She was treated with anti-heart failure measures and adequate anti-coagulation and is presently doing well.

3. Discussion

Fibrotic thickening/obliteration of ventricular apex and basal ventricular endomyocardium with involvement of papillary muscles and AV valves have been described in late stages of EMF. Mushroom sign has been demonstrated on cardiac catheterization as a result of distortion of cardiac chamber morphology by fibrosis and obliteration of the ventricular apices, along with varying degrees of mitral and tricuspid regurgitation.[2]

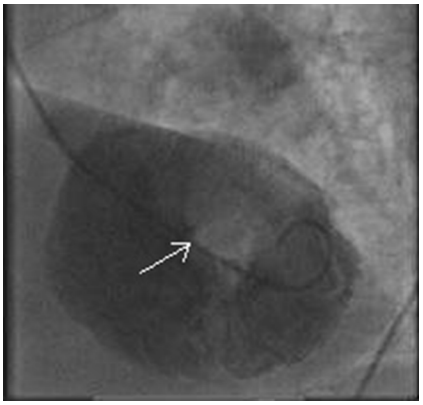

Fig. 2 – Left ventricular angiography during the diastolic phase of the cardiac cycle. Circular appearance of the LV cavity due to obliteration of the apex with hypertrophied papillary muscle (arrow) causing a central filling defect gave the appearance of a ''Doughnut''.

We describe here a novel doughnut appearance of LV on angiogram in an isolated LV EMF.

Conflicts of interest

The authors have none to declare.

REFERENCES

1. Mocumbi AO, Ferreira MB, Sidi D, et al. A population study of endomyocardial fibrosis in a rural area of Mozambique. *N Engl J Med*. 2008;359:43–49.
2. Cockshott WP. Angiocardiography of endomyocardial fibrosis. *Br J Radiol*. 1965;38:192–200.